A critical appraisal of "A Randomized Controlled Trial Comparing Rehabilitation Efficacy in Chronic Ankle Instability"

By

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Abstract

In this critical appraisal, I will be examining an article about the proper rehabilitation of chronic ankle instability (CAI). In this paper, I will introduce my formulated clinical question regarding this issue and give a proper background on the topic. I will then explain to the reader how I came across this article, why I chose it, and why I think it is valid and reliable. Once that is understood, I will begin to pick apart the article, explaining its strength and weaknesses in each titled section of the piece. Finally, I will explain why I find the article to be clinically significant and give examples of how I might use the recommended interventions during my practice as a physical therapist in the future.

Key words: Chronic Ankle Instability, Wobble Board, Resistance Tubing, TheraBand, FAAM

Introduction

My clinical appraisal will be regarding CAI and the most efficient intervention for treatment and/or lessening of the symptoms associated with the ailment. I find this topic to be important to physical therapy because of the prevalence and recurrence rate of ankle sprains in active populations. The question I will be attempting to answer is as follows; Are dynamic balance exercises or resistance training more beneficial in improving chronic ankle instability? At the end of this paper, I hope to convey to the reader the relative efficiency of each intervention in alleviating CAI symptoms.

Methods

After scouring data bases for an hour, I eventually I ended up finding my article on PubMed. As we learned in class, PubMed is a reliable and valid academic source, and the journal

of sports rehabilitation is a widely accepted and constantly updated collective of research pertaining to studies on active populations. To simplify my search efforts, I utilized some keyword listed previously in another section. The onslaught of keywords helped to narrow down my search results drastically. They also ensured that I would find more articles strictly related to my clinical question so I would not waste time with irrelevant articles. Additionally, I made sure to limit my searches to only show results for randomized controlled trials and studies that were conducted in the last 8 years. The rationale behind these limitations was to eliminate bias and to have more up to date information on CAI from JOSPT. Finally, I wanted to make sure that the amount of hits I had when searching for my article was 20 or below. This was my goal because I figured if more than that showed up, the articles would not be specific enough to my topic.

The article I decided to do my clinical appraisal on is published in the Journal of Sport Rehabilitation, was written by authors Cynthia J. Wright, Shelley W. Linens, and Mary S. Cain, and was published in 2017. Unfortunately, the article does not mention where the study was conducted, however it does give the readers information on all the author's backgrounds to help establish credibility. Wright is the corresponding author and is with the Athletic Training Program at Whitworth University, Linens is with the Department of Human Physiology at the University of Oregon, and Cain is with the Department of Kinesiology and Health at Georgia State University. I chose this article out of many to do my appraisal on because I thought it answered my question almost entirely. Additionally, the journal it was published in, the database I found it on, the random controlled trial aspect of the study, and the author's credentials gave me more than enough confidence to use this article for my clinical appraisal.

Results

Summary of the study

There were 40 subjects that were spilt into two different groups focused on modes of rehab: wobble board (WB) balance training, and resistance tubing (RT) using resistance bands. There have been studies that have confirmed that each of these interventions improve treatment outcomes in patients, but never have these two been tested head-to-head for the purpose of assessing their comparative efficacy. This study was aimed to supply clinicians with evidence about which method of CAI rehab was more effective. To carry out this study, 55 subjects were considered, but only 40 participated in the actual study because of the designated inclusion and exclusion factors. The WB balance group completed five 40 second sets of clockwise and counterclockwise rotation on the board, changing directions every 10 seconds. Contrarily, the RT group did 3 sets of 10 reps in 4 directions (plantar flexion, dorsiflexion, inversion, and eversion) with a resistance band wrapped around the foot. After this 4-week study, it was determined that both strategies significantly improved the patient's outcomes and there was little evidence to support either one being more effective than the other long term. However, subjects in the WB group reported significant increase in their Foot and Ankle Ability Measure (FAAM) scores post intervention while the RT group remained the same.

Appraisal of the study introduction

The introduction of this piece is almost totally comprehensive with little to be desired. The introduction clearly and effectively conveyed their information in a concise manner that an educated student could understand. In the intro, the authors offered statistics of the general population who experiences CAI and how common it is in athletes. They then moved on to explain the outcome measures of the study and what they were aiming to accomplish with it. Essentially, they decided to focus on patient and clinician-oriented outcomes of the participant

instead of laboratory measures to focus on the whole-person. In doing so, functional ability and pain of the ankle joint was assessed rather than participant's ankle evertor strength. Finally, the purpose of the study was described in the introduction as looking for an "answer [to] a clinical question concerning the comparative effectiveness of 2 common rehabilitation exercises aimed at reducing CAI in physically active individuals".

As mentioned previously, there is not much room for improvement in this introduction unless I were to be nit-picky. However, one glaring issue I found was that the sources they selected for their statistics of CAI occurrence in the general and athletic population were severely outdated for an article published in 2017. They used nine sources in the first paragraph alone that were written 30 years ago in the 1990's.

Appraisal of the study methods

Regarding the methods section, the article did well at utilizing a randomized control trial design with 2 randomly assigned groups of 20 individuals with similar sociodemographic backgrounds. Additionally, the study was both retrospective and longitudinal. Looking at the article in a bigger picture though, the authors were able to clearly convey the interventions used for each group and how they were going to measure each aspect they were testing. For example, there is a paragraph for each patient and clinician-oriented outcome on what they are and how they are measured.

Some drawbacks of the methods section however was that neither the evaluator nor participant was blinded in the process. In addition to that, there was no control group in this study to compare the results to. Without that, the authors cannot be sure if the exercises helped remedy CAI in patients or if the results were simply neurological placebo responses to prescribed exercise.

Appraisal of the study results

The results section of this article is the shortest and most concise of all the sections. It simply laid out what was and was not significant and what exactly each confidence interval was. All the results pointed to similar rates of improvement for each patient and clinician-outcome measures other than FAAM, in which the balance group improved, and the resistance group did not. Additionally, the tables they included were super helpful in conveying their findings.

The only thing I could have wanted that they did not include in this section would be a graph of some sort to represent their tables and data. This could have cleared up some confusion and I probably would not have had to re-read this section as many times as I did.

Appraisal of the study discussion

In the discussion, the authors presented great explanations for all the results they presented in the preceding section. They dove deep into each significant outcome measure and clearly offered new and helpful thoughts to further the discussion and support their results. In doing so they seamlessly tied in fourteen other RCTs and cross examined them to self-reflect and introduce further insight. They stated that after examining their results, they were able to conclude that both WB and RT interventions offered strong efficacy based on patient and clinician-oriented outcome measures as they both improved each at the same rate. Their conclusion was that a clinician should “feel confident selecting whichever intervention best fits with their resources and patient needs”.

While it was a good thing that the authors included their limitations, they did mention in this section that they did not examine the exact mechanisms that allowed for greater ankle

stability, so they were unaware of why each treatment was working. To be a more comprehensive study in the future, they should focus on patient and clinician-oriented outcomes, along with lab results and a biomechanist on staff to be able to explain the science behind the efficacy of each intervention

Discussion

This study is pertinent to PT practice because it attempts to answer which modality is better for improvement in patients with CAI, which 32% of patients who experience an ankle injury develop. It is of course important to know which method is more effective to treat your patients. Additionally, this is a study that attempts to answer my question of balance vs resistance training almost verbatim.

While there will need to be an additional study conducted to determine the exact mechanisms altered by such modalities, this study's results offer evidence of decreased pain and increased functional movement capability in the ankle joint with 4 weeks of WB and RT in the CAI population. I am in favor of using either modality to improve a patient's quality of life, according to their current needs. Looking at the data exclusively, each subject improved at the same rate in their personal pain questionnaires and functional mobility tests at the end of the 4-week session, except for the increased FAAM patient-oriented outcome in the WB group. This indicates that the benefits of both interventions are vast. However, some risks that could be associated with interventions such as these could stem from the balance board training. It is entirely possible that a subject with CAI could have such as unstable ankle joint that they fall during training and injure themselves even more than they already were. This potential risk was heightened during this study because all subjects were instructed to start on the same difficulty

level, regardless of prior level of function or degree of ankle instability. Fortunately, nobody was injured during this study, so in my opinion, the benefits well outweigh the risks if each subject is monitored and cared for correctly. Finally, as I mentioned before, if the researchers took the time to determine the biomechanics behind their findings the evidence could be even stronger in support of each intervention.

When I graduate from school and I am a clinician in the field, I will absolutely utilize both interventions as suitable for different patients. I trust the researcher's judgement when they said that a clinician should feel comfortable utilizing either modality in the clinic. Additionally, I am confident in my abilities to be able to implement the interventions safely, as I would cater the training to each patient's prior level of function and ankle instability measure.

When it comes down to examining this paper, I am happy they decided to go with the people first approach of medical care. As a student physical therapist, this ideology is what I have been taught since day one of the program here at Angelo State University. While this makes the article more subjective and prone to patient error at times, a typical physical therapist must rely on the word of a patient during every evaluation to assess their pain and symptoms. This factor alone was one of the main reasons I was so passionate about writing my clinical appraisal on this article.